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INTERNATIONAL GEOPHYSICAL COOPERATION PROGRAM -- SOVIET-BLOC ACTIVITIES

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I. GENERAL

International Geophysical Cooperation Among the European-Asiatic Region Nations

The following is a full translation of an article by Yu. D. Bulanzhe, Doctor of Physicomathematical Sciences and member of the Advisory Committee for the Conduct of the International Geophysical Year.

The greater part of the world's globe was divided into several regions for coordinating observations of a planetary nature which were conducted during the period of the International Geophysical Year (IGY). In particular, the European-Asiatic Region was formed, of which 12 countries are now a part: Albania, Bulgaria, Hungary, Vietnam, the German Democratic Republic, Korea, Mongolia, Rumania, Poland, the USSR, Czechoslovakia, and Yugoslavia. (The author of this article was selected at that time as secretary of this region).

In connection with the decision, which was accepted at the Fifth Assembly of the Special Committee of the IGY, held in Moscow in 1958, to continue investigations according to the IGY plan for still another year, the need for a meeting of the chairmen of the region countries arose because it was necessary to arrange a program of observations for 1959 and also to discuss the problems which are disturbing all geophysicists: What will be done after the end of the period of International Geophysical Cooperation (MGS) [IGC]? How is the use of the enormous, difficulty-obtained material of the IGY and IGC to be organized?

Precisely these problems were the center of attention of the Third Regional Conference of the European-Asiatic Region countries, which was held in Moscow 4-7 February.

The national programs for geophysical investigations in 1959, the plans for joint processing of the results of the observations, and the problems of mutual technical aid were discussed in the plenary sessions, the working groups, and the temporary commissions. The claims of the IGY World Data Center (MTsD) [WDC] in regard to the incoming materials, the problems of compiling national bibliographies and their publication, and the prospects of international cooperation by the geophysicists of the region countries after 1959 were discussed.

The solution arrived at by the working groups was discussed and accepted at the closing plenary meeting.

During the IGC period, stationary and expeditionary observations and investigations will be continued, as a rule, on the level attained toward the end of 1958 and, in a number of cases, will even exceed this level. The national programs and subjects of the planned observations revealed the inclination of the region countries toward a widening of geophysical investigations and of their close scientific coordination and toward the joint conduct of operations by the scientists of the various countries.

Thus, the geophysicists and astronomers of the USSR, the GDR, and Czechoslovakia will conduct matching observations of the October Draconids in 1959 for the purpose of studying its effect on the ionosphere over Eastern Europe.

Specialists on solar activity at the Crimean Astrophysical Observatory and the Ondrejev Observatory (Czechoslovakia) jointly propose to conduct a simultaneous study on changes in the brightness of chromospheric flares with time. The conference recommended conducting joint investigations of the Sun's radio emission by the forces of the USSR, Czechoslovakia, and Poland.

Magnetologists from Bulgaria, Hungary, the GDR, USSR, and Rumania will conduct complex comparative measurements of the horizontal components of the Earth's magnetic field.

The GDR delegation introduced a resolution to consider the possibility of continuing the joint oceanological investigations on the expeditionary ship Mikhail Lomonosov and at the hydroglaciological works near Alma-Ata in 1959.

The countries, participants in the IGY and IGC, must take a responsible position towards the problems of collection and storage of the results of observations in the world centers. These materials will serve for a long time as the basic sources of scientific investigations in the field of geophysics. The national committees are obliged to take all measures to fulfill quickly their responsibilities toward the WDC so as not to repeat the sad experience of the preceeding International Polar Year, when many materials were inaccessible for scientific processing.

To facilitate the utilization of IGY materials, the organization is recommended of permanently functioning national centers which would conduct the exchange of the accumulated materials from world centers.

The Regional Conference proposed to all national committees that the most complete bibliographic information concerning geophysical works completed in their countries, as well as the works themselves, be transmitted to the WDC. This widens the functions of the WDC and converts them into well-centralized libraries of world geophysical literature. It must be mentioned that the scientific cooperation formed in the course of the IGY considerably assisted in the development of geophysical sciences in the region countries and made it possible to conduct important investigations connected with the study of our planet. The regional

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conference was unanimously in favor of the future development of scientific cooperation of the geophysicists of the regional countries, wherein it was decided to preserve the national committees as organs for implementing such cooperation.

The principal forms of such cooperation between the region countries in the near future may be: the completion of the preliminary processing of the data of observations made during the IGY and IGC periods and the collection of these data in the WDC; the coordination of scientific investigations, assistance in the development of geophysical works in the region countries, and the rendering of mutual assistance in the form of apparatus, equipment, and materials; and conducting scientific symposiums and conferences and also yearly conferences for approving the plans of geophysical investigations. ("International Geophysical Cooperation," by Yu. D. Bulanzhe; Moscow, Vestnik Akademii Nauk SSSR, No 5, May 59, pp 113-114)

Work in the Kazakh Astrophysics Institute Under the Seven-Year Plan

Academician K. I. Satpayev, President of the Academy of Sciences Kazakh SSR, in discussing the 21st Party Congress and the problems of science in Kazakhstan, said that the Astrophysics Institute of the Kazakh Academy of Sciences will continue investigations of the structure and evolution of galactic matter in connection with the problems of the origin of stars and the investigation of solar activity and the optical properties of the different layers of the earth's atmosphere. The scattering characteristics of the earth's atmosphere as a whole and in its separate layers will be studied during investigations of the optical properties of the earth's atmosphere in different conditions of solar radiation. The problem of investigating the properties of the earth's atmosphere is closely connected with meteorological and other problems having important national economic value. A new method of astronomical investigations using a radio telescope will be employed in the Astrophysics Institute in the course of the Seven-Year Plan. ("The 21st Party Congress and the Problems of Science in Kazakhstan," by K. I. Satpayev, President Academy of Sciences, Kazakh SSR; Alma-Ata, Vestnik Akademii Nauk Kazakhskoy SSR, No 3, Mar 59, p 18)

II. UPPER ATMOSPHERE

Nuclear Explosions in Space Can Be Detected Says Soviet Scientist

Nuclear explosions in space represent the same danger to everything living as explosions in the atmosphere because of the radioactive particles gradually settling on the Earth, says Prof F. Rybkin, Doctor of Technical Sciences, writing in Sovetskiy Flot.

The professor describes American proposals for such high-altitude tests for scientific purposes as a desire to disguise the testing of nuclear arms.

Nuclear explosions at great heights cannot be produced secretly, he says, despite claims to the contrary. Experts at the Geneva meeting have established that methods based on the registration of radio signals can be used to detect such explosions up to an altitude of 1,000 kilometers. Also indicated, he states, is the fact that during the bursts, particular magnetoelectrical waves arise which spread with a speed of several hundreds of kilometers per second. These may be detected in the lower layers of the atmosphere with the use of appropriate acoustical instruments.

Intense aurorae, as a rule, are accompanied by various disturbances in the field of radio communications. These same phenomena must also occur during artificial aurorae.

In addition to this, a neutron cloud, quickly scattering in different directions, arises in the zone of the nuclear explosion. If a flying device with an atomic motor or an atomic charge falls into such a neutron cloud, then the uranium 235 or plutonium they contain will be intensely heated. An atomic explosion will not occur under these circumstances. However, strong heating can lead to the melting of the uranium-235 or the plutonium and to the destruction of the atomic motor or charge. ("Shameless Deceit," by Prof F. Rubkin, Doctor of Technical Sciences; Moscow, Sovetskiy Flot, 25 Jun 59, p 4)

Study on the Relationship of Geomagnetic Activity and the Disturbed Condition of the F2 Layer

A close relationship exists between disturbances of the geomagnetic field and the anomalous phenomena in the F2 layer of the ionosphere. Anamolous deviations from the normal values of the critical frequencies of f^o and the actual altitude h' of the layer, which, in a number of cases, leads to the disruption of radio communication, are very frequently observed during geomagnetic storms.

It is noted that the majority of researchers, in their investigations, have not made a strict simultaneous separation of the ionospheric disturbance according to the fluctuation symbols f^oF2 and h'F2 and the degree of geomagnetic activity and, in deriving the aperiodic variation, did not separate the geomagnetic storms, according to the nature of their beginnings, into storms with a gradual onset and those with a sudden onset. In the author's opinion, such a distinction could have been of aid in explaining the nature of ionospheric disturbances.

An attempt at such a distinction is made in the present work, and the following problems are posed:

1. To explain the regularities of the diurnal distribution of positive and negative ionospheric disturbances of the F2 layer in relation to the degree of geomagnetic activity and the geomagnetic latitude.

2. To consider the regularity of the distribution of the positive and negative ionospheric disturbance during geomagnetic storms in relation to the nature of the latter's beginning and the geomagnetic latitude of the place of observation.

Despite the fact that the results obtained are considered to require further confirmation based on broader material, especially for the maximum of the 11-year cycle of solar activity, for example, for the period of the International Geophysical Year, the author feels that the following preliminary conclusions can be made:

1. The nature of the geographic distribution of positive and negative ionospheric disturbances of the F2 layer, during which a lowering of the critical frequencies is characteristic for the high and middle latitudes as is their increase during geomagnetic disturbances for the low and equatorial latitudes, is confirmed.

2. The direct relationship between the degree of geomagnetic activity and the negative ionospheric disturbance and the absence of such for positive disturbances in the high and middle latitudes makes it possible to speak of a difference in the nature of the latter.

3. The geomagnetic latitudes from 35-40 degrees are the boundary zone between the middle latitudinal and equatorial character of the distribution of the ionospheric disturbed state.

4. Magnetic storms with a sudden onset are accompanied by an increase in the probability of the appearance of negative disturbances of the layer in all geomagnetic latitudes from 30 to 55 degrees. Magnetic storms with a gradual beginning are connected with an increase in the probability of the appearance of a negative disturbed state at latitudes of about 55 degrees and by a decrease at a latitude of 30 degrees.

5. In short-range forecasting for radio communication, the insignificant percentage of negatively disturbed hours for the F2 layer (not more than 5 percent for winter and 3 percent for the equinox and summer) on magnetically quiet days for any time of the day within the limits of the geographic latitudes from 40 to 60 N should be considered and, consequently, calculated only for the normal (1000-1600 hours of the zone time) or the somewhat heightened (the remainder of the 24 hours) level

of the critical frequencies (not more than 30 percent probability for the Leningrad station and not more than 15 percent for the remainder of the stations -- Bukhta Tiksi, Moscow, Sverdlovsk, Irkutsk, Alma-Ata, and Ashkhabad). In addition, the equipping of ionospheric stations with magnetographs which permit the conduct of continuous observations of the permanent magnetic field is of great value. ("The Problem Concerning the Relationship of Geomagnetic Activity and Disturbances of the F2 Layer of the Ionosphere," by V. G. Dubrovskiy, Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR; Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, No 2, 1959, pp 3-12)

III. METEOROLOGY

Proposed Isoline Method for More Accurate Meteorological Charts

On the assumption that a geometrization of an isoline method should afford the possibility of constructing more authentic and accurate meteorological charts by geometric necessity, rather than arbitrarily, the principles of construction of a system of isolines are presented which are based on a geometrical classification of polygons formed by the intersecting isolines of two superimposed systems. Each of the polygonal forms, systematized in four tables, has, for the same index, an unlimited number of morphological variants, the presence of which does not represent an obstacle to the use of such isoline systems, since each rule of execution of one or the other operation applies for any of the basic figures, thus actually for all morphological variants. It is shown that the position of each isoline, drawn within the limits of a figure produced by the superpositioning of two systems of isolines, is not an arbitrary line, but a geometric necessity.

Graphic addition and subtraction are done by pairs of systems. In superimposed isoline polygons, there are, at most, two angles where the sums of the isoline intersections are equal. The resultant isolines pass through all intersecting isolines of the two systems and through one of two pairs of vertical angles and never intersect isolines of the original system at other points. In addition to the form of the figures and the values of the isolines, consideration must be given to the mutual direction of the gradients between two isolines of the two system inside the figures. In practice, addition and subtraction of systems are done on the assumption that, between pairs of isolines of the two original systems, there is a straight-line (increasing or decreasing) change of elements. Between equal isolines, the gradient has one sign at an average distance between them and the opposite sign beyond this point. Each side of a curvilinear polygon is considered a convex line (on one or the other side). Allowances for small intervals between isolines at certain points and for small dimensions of the figure do not lead to appreciable errors nor cause any essential distortion of the resultant isoline, since these errors, as random errors, are generally neglected during further operational steps.

The utilization of isolines drawn in accordance with the principles of geometry is considered an approach to a general geometrization of the isoline method which affords the possibility of solving various problems of climatography (and of other sciences using the isoline method) geometrically. ("On the Properties of Isolines and Their Systems," by N. I. Guk; Moscow, Trudy Ukrainskogo Nauchno-issledovatel'skogo Gidrometeorologicheskogo Instituta, No 13, 1958, pp 46-68)

Visibility Forecasts During Snowstorms

In the Ukraine, low-altitude snowstorms and the brief reduction of visibility associated with them occur primarily in January and February. In 62 percent of low-altitude snowstorms, visibility is reduced to at least 2 kilometers, and in 89 percent of such storms, to one kilometer. The necessary conditions for the occurrence of low-altitude snowstorms are the intensification of the wind during below zero temperatures and the presence of a snow cover.

In the majority (92 percent) of cases, low-altitude snowstorms develop when dry scattered snow is on the ground. If there is a cover of packed snow, low-altitude snowstorms occur only if the wind is greater than 15 meters per second (29 knots) and predominantly when winds are over 18 meters per second (41.4 knots).

Low-altitude snowstorms predominate in the Ukraine when the wind is from the east or northeast; they occur only when the Ukraine is on the southern or southwestern edge of an anticyclone, the center of which is over the central or eastern region of the European part of the USSR, when, at the same time, a certain cyclonic activity is observed over the Black Sea.

A reduction of visibility to one kilometer and less is observed in 79.5 percent of the cases when the wind is greater than 14 meters per second (27 knots). During low-altitude snowstorms, there is an inverse relationship between the velocity of the wind and visibility, thus the visibility can be computed on the basis of the velocity of the wind. Since the velocity of the wind is predicted on the basis of the baric field, it is possible to use the above relationship to obtain the predicted velocity of the wind, if the expected value of the baric gradient is known. ("Some Pecularities of the Forecasting of Visibility During Low-Altitude Snowstorms in the Ukraine," by N. M. Gavrilenko; Moscow, Trudy Ukrainskogo Nauchno-issledovatel'skogo Gidrometeorologicheskogo Instituta, No 12, 1958, pp 21-30)

Study on Prediction of Icing

It is shown that, under certain conditions, the probability of the onset of intensive icing can be determined by computing the transformation change of the relative geopotential N^{850}_{1000} and temperature of the air at the 850-mb level in relation to the predicted precipitations and air temperatures at the Earth's surface.

To predict the OT^{850}_{1000} value (the "transformation change" value), it is first necessary to determine, on the basis of the initial AT_{850} chart, an OT^{850}_{1000} value for a given point, as well as the OT^{850}_{1000} value for the

24-hour period prior to the beginning of the trajectory, with the wind velocity taken into account. Thus, with the aid of a graphic, the transformation change can be determined on the basis of the advective change of the relative geopotential N_{1000}^{850}. A transformation correction, with the appropriate sign, is applied to the OT_{1000}^{850} value obtained for the beginning of the trajectory of the 24-hour period. The corrected result is the OT_{1000}^{850} value for the given point 24 hours later.

The temperature forecast at the 850 mb level is done by an analytical method, i.e., by a simple transfer along the AT_{850} contour, with the transformation change taken into account. The air temperature at the surface of the earth is forecast by an ordinary method. On the basis of the forecast air temperature at the Earth's surface and the computed value of the relative geopotential, the probability of the precipitation of supercooled rain, and thus the probability of icing, is determined with the aid of a graphic. The forecast air temperature at the 850 mb level is used to improve the accuracy of the above probability determination.

During frontal processes, the values of the relative geopotential and air temperature at the 850 mb level should be taken in the frontal zone. In the overwhelming majority of cases, frontal icings are observed during the passage of a warm front; for this reason, the value of the prognosed elements should be considered for the zone of warm air. ("On the Possibility of Predicting the Onset of Intensive Icing," by N. M. Volevakha and V. A. Volevakha; Moscow, Trudy Ukrainskogo Nauchno-issledovatel'skogo Gidrometeorologicheskogo Instituta, No 12, 1958, pp 81-87)

Study on Cloud Characteristics in Frontal Zones

On the basis of a statistical study of a great number (over 12,000) of observations of cloud formations, primarily with lower limits below 1,000 meters, during the passage of warm and cold fronts over the southwestern part of the European USSR, the following conclusions were drawn:

1. In most (76 percent) cases, during the passage of fronts, the lower limit of cloud formations is not higher than 600 meters, while in a considerable number (45 percent) of cases, it is below 300 meters. Within the limits of the latter range, clouds are most frequently observed at a height of 100-300 meters, with approximately equal occurrence in the 100-200 and 200-300-meter ranges; clouds are rarely observed below 100 meters, however.

2. The lowest clouds (below 300 meters) are most frequently observed during the passage of warm fronts. Clouds with lower limits above 300 meters are observed most frequently during the passage of cold fronts.

3. In a warm frontal zone, cloud formations are observed in a majority (81 percent) of cases at an altitude of up to 600 meters, and in 79 percent of the cases, they are found in a zone about 400 kilometers wide, 300 kilometers ahead of and 100 kilometers behind the front, i.e., in a zone of

precipitations which reach the surface of the earth. Clouds below 300 meters occur primarily in the 100-kilometer zone directly ahead of the frontal line. A general occurrence of clouds at an altitude of up to 100 meters is found in no more than 8 percent of the cases, half of which are encountered in a 100-kilometer zone directly ahead of the front.

4. In a cold frontal zone, clouds below 100 meters are encountered only about half as frequently as in a warm frontal zone. The occurrence of clouds with a lower limit below 300, 300 to 600, and above 600 meters is almost of equal probability. The most favorable conditions for the occurrence of clouds with lower limits below 300 meters are found in a zone 200 kilometers wide, 100 kilometers ahead of and 100 kilometers behind the front.

5. The dominant types of clouds in a warm frontal zone are nimbostratus, Fractonimbus (Ns, Fn) and Stratus, Fractostratus (St, Fs), which, in the majority of cases, are the lowest (below 300 meters), and also Stratocumulus (Sc), which are the highest. The small number (2-3 percent) of cases of convective clouds in the warm frontal zones, especially near the frontal line, supports the theory of the possibility of a formation of convective clouds in warm fronts, but, at the same time, indicates that the probability of such cases is not great.

6. The predominant types of clouds in a cold frontal zone are stratocumulus and nimbostratus, fractonimbus. Occurrences of the former (in different parts of a frontal zone) were observed in 43-63 percent of the cases, and occurrences of the latter, in 19-29 percent of the cases. Nimbostratus and Fractostratus clouds reach a maximum in a zone 200 kilometers wide, 100 kilometers ahead of and 100 kilometers behind the front. Cumulus, Cumulonimbus (Cu, Cb) clouds are observed most frequently 200-300 kilometers ahead of the front.

7. In general, during the passage of both warm and cold fronts, Stratocumulus and Nimbostratus, Fractonimbus clouds predominate; only in a warm frontal zone is there a maximum occurrence of Nimbostratus, Fractonimbus clouds at a height below 300 meters. In a cold frontal zone, however, Stratocumulus clouds occur most frequently at an altitude of 300-600 meters.

("The Characteristics of Low Clouds in a Zone of Atmospheric Fronts," by V. Ya. Lobanova and M.V. Sokolova; Moscow, Trudy Nauchno-issledovatel'skogo Instituta Aeroklimatologii, No 5, 1958, pp 42-50)

New Instrument For Measuring Parameters of Ground Air Layer

A plan for an instrument using semi conductor thermistors for measuring three important characteristics of the ground layer of air--the temperature, humidity, and the effective radiation--simultaneously is proposed by R. V. Parfen'yev and F. A. Chudnovskiy. A comparison of the measurements obtained in laboratory tests with theoretical calculations based on the formula

$$E = T^4 (a-b \sqrt{e}),$$

(where E is the effective radiation; T is the absolute temperature; $a = 0.39$; $b = 0.058$; $\sigma = 8.26 \cdot 10^{-11}$ calories per square centimeter per minute per degrees to the fourth power; and e is the vapor tension expressed in millimeters) showed that the error of instrument readings was not high and that the accuracy was satisfactory. The mean error throughout the interval E = 0.05-0.20 calories per square centimeter per minute did not exceed 0.0015 calories per square centimeters per minute. ("Use of Semiconductor Thermistors As Transducers for the Automatic and Simultaneous Measurement of Temperature, Humidity, and Effective Radiation," by R. V. Parfen'yev and F. A. Chudnovskiy; Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol 2, No 4, Apr 59, pp 87-92)

IV. OCEANOGRAPHY

The Severyanka's Three Voyages

V. P. Zaytsev, Director of the All-Union Scientific Research Institute of the Fish Economy and Oceanography (VNIRO), reports that the institute's research submarine, Severyanka, has completed three voyages. Two of these expeditions were made in the Barents Sea and the third in the Atlantic Ocean. ("The Three Voyages of the Severyanka," Moscow, Pravda, 14 Jun 59, p 6)

V. ARCTIC AND ANTARCTIC

Results of Hydrographic Research in Antarctic

Valuable cartographic material has been obtained as a result of the work conducted by the hydrographic detachment of the Soviet expedition along the coast of Antarctica and in the waters adjoining it during the antarctic summer 1955-1956. The results obtained by final processing of this material will be used in the compilation of new maps and revision of existing maps and charts.

On the basis of cartographic material collected during the first voyage of the Complex Antarctic Expedition, the Hydrographic Service of the Navy compiled the following maps and charts of the antarctic coast:

(1) Chart No 5985 (morskoy plan) of the Mirnyy roadstead, scale 1:10,000, first edition, published 15 September 1956;

(2) Nautical chart No 5997 of Davis Sea, scale 1:500,000, new edition, published 22 September 1956;

(3) Two topographic maps of Bunger "Oasis," scale 1:50,000, and one topographic map of a group of nunataks located southwest of the "oasis," scale 1:50,000, 1956 edition.

In addition, a number of Soviet nautical charts of the Antarctic, No 5998 and No 5999 with a scale of 1:500,000, and No 5994, No 5995, and No 5996, with a scale of 1:2,500,000, have been revised with the help of data obtained by the Soviet Antarctic Expedition and some of the most recent foreign cartographic material.

It is quite natural that the above-mentioned Soviet nautical charts (with the exception of the chart of Mirnyy roadstead and the maps of the "Oasis") still contain many "white spots" and doubtful data, mainly in the area of the northern and northeastern border of the Shackleton Ice Shelf, mapped on the basis of materials of the Byrd Expedition. However, out of all existing nautical charts and geographic maps of the antarctic coast, the maps published by the Soviet Hydrographic Service, with the help of materials of the Complex Antarctic Expedition, are at present the most reliable and large-scale maps available.

In general, the following changes were made on maps of the Indian sector of Antarctica and the adjoining waters, as a result of the work of the hydrographic detachment of the Complex Antarctic Expedition:

(1) The coastline of the antarctic continent within the boundaries of Davis Sea has been shifted in a general northern direction. The location and configuration of the outlying sea boundaries of the Shackleton Ice Shelf, West Ice Shelf, and Helen Glacier have been defined more accurately.

(2) The region of Bunger "Oasis," Farr Bay, and the Mirnyy observatory, was charted for the first time on detailed, reliable maps. In place of a single Haswell Island and six small adjoining islands, shown on British maps, 25 islands and above-water rocks were discovered in this area and were indicated on the map. As a result of a detailed survey of the bottom relief in the "Mirnyy roadstead," underwater navigational hazards were discovered and indicated on the chart, as well as channels enabling ships to approach the Mirnyy observatory. Gaussberg, according to recent observations, should be indicated on the map 7 minutes further east.

(3) The coastline of the continent within the boundaries of the Shackleton Ice Shelf has been moved on the maps 7-8 miles to the north. The actual location of Mill Island, according to reconnaissance data, is 30 miles southwest of the location shown on foreign maps. At the same time, the northeast edge of the Shackleton Ice Shelf is moved correspondingly to the southwest.

(4) The large bay, penetrating deeply into Knox Coast just east of the Shackleton Ice Shelf, as shown on the German map by Kozak, has not been confirmed. The coastline shown on maps of this area should be moved 40-45 miles to the north.

(5) A general picture of the submarine relief of Davis Sea has been obtained (characteristic elevations and depressions of the sea bottom).

(6) In several places of the explored coast of Antarctica, considerable discrepancies were found between the actual data of magnetic declination and those indicated on the charts. By comparing the astronomical and magnetic azimuths, it was determined that in the area of Mirnyy the western declination is 10 degrees more, and in the area of the Snyder Rocks 15 degrees more than indicated on the charts.

(7) The first voyage of the Ob' helped to obtain more accurate information regarding Discovery Land, found by a British expedition in 1936 and indicated on maps with the notation "Location Doubtful." A search for this land in the region shown on the maps produced no positive results. In one of the spots, where the map indicated the northern coast of Discovery Land (65-42 S, 126-57 E), there was actually a sea with a depth of 456 meters.

(8) Some inaccuracy was discovered in the map designation of the Gribb Bank. With the help of a deep-water survey made from the Ob' and coordinated with data of astronomical observations, it was established that in a spot where the maps show a bank with minimum depths of 349 to 479 meters, the actual depths were 3,513 to 3,833 meters.

Thus, despite its reconnaissance nature, the hydrographic work done by the Complex Antarctic Expedition of the Academy of Sciences USSR during its first voyage (1955-1956) has been a noticeable contribution to the cartography of the Antarctic. On the basis of this work it was possible not only to make corrections concerning the location and outline of the antarctic continent and the relief of the adjoining ice shelf, within the Indian sector of Antarctica, but also to undertake further, more extensive hydrographic investigations of the antarctic coast. (Trudy Kompleksnoy Antarkticheskoy Ekspeditsii Akademii Nauk SSSR, Moscow, 1958, pp 169-171)

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